

REMARKS

In the Official Action, the Examiner withdrew the rejection based on the combination of Matsuura et al., U.S. Patent No. 5,508,357, and Yamaya et al., U.S. Patent No. 4,987,207, but maintained the rejection based on the combination of Yamaya et al. and Matsuura et al.

Although applicants do not agree that the previous claims were met by the asserted combination of patents, the present Amendment revises claim 1 so that the metal foil layer is recited as being a rolled copper foil or electrolytic copper foil. These copper foils are disclosed in the specification, such as on page 22, and it will be noted that the Examples relating to this aspect of the invention (see the Examples starting with Example 5, as noted in the remarks of the previous response) provide superior results including the absence of voids. In this respect, it will be appreciated from the discussion provided on pages 2-3 that the presence of pinholes is a substantial problem in the art, particularly with respect to base materials for chip-on-films and that the present invention addresses this problem. It is also for this reason that claim 1 has been further amended to refer to a base material for a chip-on-film or a flexible substrate.

As now defined in claim 1, the present invention relates to a metal laminate comprising a layer of a resin composition obtained by compounding a bismaleimide compound represented by defined formula (1) which recites, *inter alia*, a substitution position on the benzene ring in which X or N has a substitution position of meta to that of another X or N that is bonded to the same benzene ring. Claim 1 further recites a metal foil layer which is a rolled copper foil or an electrolytic copper foil, with the laminate also comprising one or more polyimide film(s). The claim still further

provides that the metal laminate has a structure in which the layer of the resin composition is formed on one surface or both surfaces of the one or more polyimide film(s) and the metal foil layer is formed on one surface or both surfaces of the layer of the resin composition and wherein the metal laminate is used as a base material for a chip-on-film or flexible substrate.

Not only can the presently claimed laminate provide improvements in resistance to pinholes, but applicants have previously explained during the course of prosecution that by following the teachings of the present invention, one can obtain high solder heat resistance and have provided technical evidence in the form of a Declaration Under 37 C.F.R. §1.132 filed on February 15, 2007, to show that solder heat resistance and tensile shear strength are distinct characteristics.

Yamaya et al. does not disclose or suggest the presently claimed invention and certainly does not in any way teach resin compositions as the base materials for a chip-on-film or the challenges which pinholes can present for such materials. Nor does Yamaya et al. recognize that the present invention can provide high solder heat resistance. Instead, Yamaya et al. discloses a thermosetting resin composition containing defined amounts of a polyimide and a bismaleimide. As set forth in column 5, the resin composition can be used to prepare prepregs by being impregnated into base materials, such as glass cloths, carbon cloths or the like. Alternatively, the resin composition can be formed into a film by being cast on a glass plate, stainless steel plate or the like. Finally, the resin composition can be used in the form of a powder as a molding material.

Although Yamaya et al. mentions in passing in the column beginning at column 6, line 14 that the resin composition can be used in a variety of applications,

including laminates, there is nothing in the patent which would lead one of ordinary skill in the art to the specific laminate defined in the claims of record which uses a metal foil layer which is a rolled copper foil or an electrolytic copper foil and which is used as a base material for a chip-on-film or a flexible substrate. Furthermore, there is nothing in the patent which would lead one of ordinary skill in the art to the recognition that the present invention can provide the significant advantages demonstrated in the evidence of record including the avoidance of voids.

Applicants have previously explained that the bismaleimides of Yamaya et al. do not all meet the claimed bismaleimide compound and have stated the reasons why Yamaya et al. also does not recognize the importance of the defined bismaleimide compound with the recited substitution position. In addition, with the response filed on March 17, 2006, applicants provided a Declaration Under 37 C.F.R. §1.132 showing the importance of this recitation and in the response filed on August 16, 2006, explained why the Examiner's attempt to rely on the tensile shear strengths of Examples 16 and 17 of the patent was improper in view of other Examples in the patent which had superior shear strengths.

Matsuura et al. does not remedy the deficiencies of Yamaya et al. Matsuura et al. discloses defined polyimides which have solubility in organic solvents and other characteristics as set forth in column 1, lines 12-20. One of the disclosed utilities of the polyimide is with a polymaleimide in order to provide an adhesive or varnish that is used in the preparation of printed circuit boards or prepregs, but the emphasis in the patent is on the polyimide. In this respect, Examples 1-3 of Matsuura et al. only prepare a polyimide and it is not until Example 4 that a polymaleimide is included. Furthermore, it will be noted that **Comparative** Examples 7 and 8 use the same

polymaleimide that is used in certain illustrative Examples with comparative polyimides. Thus, the emphasis of Matsuura et al. is on the polyimide, not the polymaleimide.

The Examiner has recognized that the polymaleimide of Matsuura et al. does not meet the defined bismaleimide compound recited in the claims of record, but has essentially asserted that it would be obvious to use the polyimide-bismaleimide composition of Yamaya et al. in metal laminates according to Matsuura et al.

Applicants respectfully submit that this hypothetical combination of patents is not proper. As pointed out above, Matsuura et al. is not seeking to prepare a metal laminate, but rather is seeking a novel polyimide which can be used in a variety of environments, one of which is in combination with a polymaleimide compound (which is distinct from the bismaleimide compound recited in claim 1). Absent improper resort to applicants own specification, those of ordinary skill in the art would not seek to combine the patents in the manner proposed by the Examiner.

Even assuming that a proper basis exists for combining the patents, the collective teachings of the patents would still not result in the presently claimed invention or an appreciation of the advantageous results that can be obtained therefrom. As discussed above, there is nothing in Yamaya et al. that would lead those of ordinary skill in the art to the specifically claimed bismaleimide compound amongst any of the other compounds of the patent. Furthermore, the prior art does not explicitly describe the now-claimed rolled copper foil and electrolytic copper foil recited in claim 1 and does not recognize the improvements in solder heat resistance and pinhole resistance which can be obtained (which is particularly important for a base material for a chip-on-film which the claim also now recites).

The substantial advantages which can be obtained in accordance with the present invention cannot be ignored. In the Official Action, the Examiner commented that the advantages, particularly improved solder heat resistance, were not in the claims. Applicants respectfully note that it is not necessary to recite such advantages in order for them to be considered. As held in *Preemption Devices, Inc. v. Minnesota Mining and Manufacturing Company*, 221 USPQ 841, 844 (Fed. Cir. 1984), it is not the function of claims to include advantages or "sales pitch features", but it is proper to consider advantages directly flowing from invention in evaluating nonobviousness (which in that case were the foundation of commercial success).

For all the reasons above, applicants respectfully maintain that the presently claimed invention is patentable over the cited prior art, particularly in view of the evidence of record, and therefore request reconsideration and allowance of the present application.

Should the Examiner have any questions concerning the subject application, the Examiner is invited to contact the undersigned attorney at the number provided below.

Respectfully submitted,

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